

- [54] **DISPLAY SYSTEMS**
- [75] Inventors: **Cyril Hilsum, Malvern; Adrian Leonard Mears, Leckhampton, near Cheltenham, both of England**
- [73] Assignee: **The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England**
- [22] Filed: **Aug. 12, 1974**
- [21] Appl. No.: **496,716**
- [30] **Foreign Application Priority Data**  
 Aug. 15, 1974 United Kingdom..... 38635/73
- [52] **U.S. Cl.**..... **340/324 M; 315/169 TV; 340/166 EL; 340/173 DR**
- [51] **Int. Cl.<sup>2</sup>**..... **G08B 5/36**
- [58] **Field of Search** ..... **340/173 LS, 173 PL, 340/173 DR, 173 CA, 324 M, 166 EL; 315/169 TV**

3,848,237 11/1974 Geilhufe et al..... 340/173 DR

*Primary Examiner*—David L. Trafton  
*Attorney, Agent, or Firm*—Stevens, Davis, Miller & Mosher

[57] **ABSTRACT**

A refreshed electro-optic display comprising a plurality of individually addressed display elements which may be arranged in a matrix form is characterised in that the memory for refreshing is derived from the display elements themselves. Each display element is refreshed by sensing by one or a plurality of sensors the state of a physical property of the element to detect whether or not it has been selected to be operated and by feeding a control signal in an individual feedback loop from the sensor to open an electronic gate, to apply an electrical potential to the element, when sensed to be operated, to keep it in the operated state. The physical property sensed may be the electrical capacitance or resistance of the display elements, the state of light emission or modulation from them or the state of charge storage within them. Preferably a voltage is developed which depends on the state of the property. In that case the sensor can comprise a voltage comparator which compares the sensed voltage with a reference voltage. The display elements may for example be liquid crystal, electroluminescent electrochromic, electrophoretic, or minature plasma elements.

**9 Claims, 3 Drawing Figures**

- [56] **References Cited**
- UNITED STATES PATENTS**
- 2,847,615 8/1958 Engelbart..... 340/173 LS
- 3,533,089 10/1970 Wahlstrom..... 340/173 DR
- 3,559,190 1/1971 Bitzer et al..... 340/173 PL
- 3,796,997 3/1974 Johnson et al..... 340/173 PL
- 3,821,720 6/1974 Greubel et al..... 340/173 LS

